

CLAIM AMENDMENTS

The following listing of claims replaces all prior versions and listings of claims in this application.

1. (Currently Amended) A detonator assembly, comprising:
a capacitor;
an initiator mechanically and electrically connected to the capacitor, ~~the initiator being bonded or fused to the capacitor;~~
a transformer mechanically and electrically connected to the capacitor; and
an addressable chip mechanically and electrically connected to the transformer, wherein the capacitor, initiator, transformer, and addressable chip form a unified integrated detonating unit adapted to respond to a command communicated from a remote source to activate an explosive.
2. (Original) The detonator assembly of claim 1, further comprising a capacitor discharge unit, the capacitor discharge unit comprising the capacitor and a resistor.
3. (Original) The detonator assembly of claim 2, wherein the capacitor discharge unit further comprises a thick-film circuit that electrically connects the capacitor and the resistor.
4. (Original) The detonator assembly of claim 3, wherein the resistor comprises a bleeder resistor formed by thick-film deposition, the bleeder resistor adapted to bleed charge from the capacitor.
5. (Original) The detonator assembly of claim 4, wherein the resistor comprises a charging resistor formed by thick-film deposition, the charging resistor adapted to receive a charging voltage for the capacitor.

6. (Original) The detonator assembly of claim 2, wherein the capacitor discharge unit further comprises an integrated micro-switch, the micro-switch adapted electrically to couple the charge from the capacitor to the initiator when activated.

7. (Original) The detonator assembly of claim 6, wherein the micro-switch comprises one of a microelectromechanical system switch, a bistable microelectromechanical switch, a spark gap switch, a switch having nanotube electron emitters, a MOSFET, and an IGFET.

8. (Original) The detonator assembly of claim 1, wherein the initiator comprises one of a semiconductor bridge, exploding bridge wire, and exploding foil initiator.

9. (Original) The detonator assembly of claim 2, wherein the initiator comprises an exploding foil initiator fused directly to the capacitor discharge unit.

10. (Original) The detonator assembly of claim 1, further comprising an explosive proximate the initiator.

11. (Original) The detonator assembly of claim 2, wherein the capacitor is fabricated from a dielectric ceramic material.

12. (Original) The detonator assembly of claim 2, wherein the resistor is selected from the group consisting of a thick-film resistor and a thin-film resistor.

13. (Original) The detonator assembly of claim 1, wherein the transformer is a piezoelectric transformer.

14. (Original) The detonator assembly of claim 1, further comprising a second transformer adapted to generate a trigger pulse to fire the initiator.

15. (Original) The detonator assembly of claim 1, wherein the addressable chip is adapted to identify one or more initiators from a set of initiators.

16. (Original) The detonator assembly of claim 15, wherein the addressable chip is adapted to selectively charge one or more initiators from the set of initiators.

17. (Original) The detonator assembly of claim 15, wherein the addressable chip is adapted to selectively delay for a predetermined time the charging of one or more initiators from the set of initiators.

18. (Original) The detonator assembly of claim 15, wherein the addressable chip is adapted to selectively fire one or more initiators from the set of initiators.

19. (Original) The detonator assembly of claim 15, wherein the addressable chip is adapted to selectively delay for a predetermined time the firing of one or more initiators from the set of initiators.

20. (Original) The detonator assembly of claim 1, wherein the addressable chip is adapted to inactivate the initiator.

21. (Original) The detonator assembly of claim 1, wherein the addressable chip is adapted to activate a sensor.

22. (Original) The detonator assembly of claim 21, wherein the sensor is a pressure sensor.

23-27 (Cancelled)

28. (Original) The detonator assembly of claim 1, wherein the addressable chip is adapted to disconnect a bottom-fired initiator from a string of initiators.

29. (Previously Presented) The detonator assembly of claim 1, further comprising a housing adapted to house the unified integrated detonating unit.

30. (Original) The detonator assembly of claim 29, wherein the housing has an outer diameter of approximately 0.28 inches.

31. (Original) The detonator assembly of claim 29, wherein the housing is adapted to couple with a detonating cord having a predetermined diameter.

32-48 (Cancelled)

49. (Previously Presented) A detonator assembly, comprising:
a capacitor;
an initiator mechanically and electrically connected to the capacitor;
a transformer electrically connected to the capacitor, the transformer being bonded or fused to the capacitor; and
an addressable chip mechanically and electrically connected to the transformer, wherein the capacitor, initiator, transformer, and addressable chip form a unified integrated detonating unit adapted to respond to a command communicated from a remote source to activate an explosive.

50. (Previously Presented) The detonator assembly of claim 49, further comprising a capacitor discharge unit, the capacitor discharge unit comprising the capacitor and a resistor.

51. (Previously Presented) The detonator assembly of claim 50, wherein the capacitor discharge unit further comprises a thick-film circuit that electrically connects the capacitor and the resistor.

52. (Previously Presented) The detonator assembly of claim 51, wherein the resistor comprises a bleeder resistor formed by thick-film deposition, the bleeder resistor adapted to bleed charge from the capacitor.

53. (Previously Presented) The detonator assembly of claim 52, wherein the resistor comprises a charging resistor formed by thick-film deposition, the charging resistor adapted to receive a charging voltage for the capacitor.

54. (Previously Presented) The detonator assembly of claim 50, wherein the capacitor discharge unit further comprises an integrated micro-switch, the micro-switch adapted electrically to couple the charge from the capacitor to the initiator when activated.

55. (Previously Presented) The detonator assembly of claim 54, wherein the micro-switch comprises one of a microelectromechanical system switch, a bistable microelectromechanical switch, a spark gap switch, a switch having nanotube electron emitters, a MOSFET, and an IGFET.

56. (Previously Presented) The detonator assembly of claim 49, wherein the initiator comprises one of a semiconductor bridge, exploding bridge wire, and exploding foil initiator.

57. (Previously Presented) The detonator assembly of claim 50, wherein the initiator comprises an exploding foil initiator fused directly to the capacitor discharge unit.

58. (Previously Presented) The detonator assembly of claim 49, further comprising an explosive proximate the initiator.

59. (Previously Presented) The detonator assembly of claim 50, wherein the capacitor is fabricated from a dielectric ceramic material.

60. (Previously Presented) The detonator assembly of claim 50, wherein the resistor is selected from the group consisting of a thick-film resistor and a thin-film resistor.

61. (Previously Presented) The detonator assembly of claim 49, wherein the transformer is a piezoelectric transformer.

62. (Previously Presented) The detonator assembly of claim 49, further comprising a second transformer adapted to generate a trigger pulse to fire the initiator.

63. (Previously Presented) The detonator assembly of claim 49, wherein the addressable chip is adapted to identify one or more initiators from a set of initiators.

64. (Previously Presented) The detonator assembly of claim 63, wherein the addressable chip is adapted to selectively charge one or more initiators from the set of initiators.

65. (Previously Presented) The detonator assembly of claim 64, wherein the addressable chip is adapted to selectively delay for a predetermined time the charging of one or more initiators from the set of initiators.

66. (Previously Presented) The detonator assembly of claim 64, wherein the addressable chip is adapted to selectively fire one or more initiators from the set of initiators.

67. (Previously Presented) The detonator assembly of claim 64, wherein the addressable chip is adapted to selectively delay for a predetermined time the firing of one or more initiators from the set of initiators.

68. (Previously Presented) The detonator assembly of claim 49, wherein the addressable chip is adapted to inactivate the initiator.

69. (Previously Presented) The detonator assembly of claim 49, wherein the addressable chip is adapted to activate a sensor.

70. (Previously Presented) The detonator assembly of claim 69, wherein the sensor is a pressure sensor.

71. (Previously Presented) The detonator assembly of claim 1, wherein the command is communicated to the unified integrated detonating unit via a stimulus comprising an electrical signal, a motion signal, a hydraulic pressure or pressure pulses.

72. (Previously Presented) The detonator assembly of claim 1, wherein the remote source is disposed in a well.

73. (Previously Presented) The detonator assembly of claim 1, wherein the remote source is disposed at the surface of a well.

74. (Previously Presented) The detonator assembly of claim 1, wherein the unified integrated detonating unit is adapted to be disposed in its entirety downhole in the well.

75. (Previously Presented) The detonator assembly of claim 49, wherein the command is communicated to the unified integrated detonating unit via a stimulus comprising an electrical signal, a motion signal, a hydraulic pressure or pressure pulses.

76. (Previously Presented) The detonator assembly of claim 49, wherein the remote source is disposed in a well.

77. (Previously Presented) The detonator assembly of claim 49, wherein the remote source is disposed at the surface of a well.

78. (Previously Presented) The detonator assembly of claim 49, wherein the unified integrated detonating unit is adapted to be disposed in its entirety downhole in the well.